DoD Corrosion Prevention and Control Status and Update

Presentation to

2004 Defense Standardization
Program Conference

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Corrosion Engineer, circa 1480 B.C.E.

















427 BC–Plato (Socrates student) Phaedo

"For this earth, and the stones and the entire region which surrounds us are spoilt and corroded, like the things in the sea which are corroded by the brine..."

•1675–Robert Boyle



















• 1813 – Sir Michael Faraday

Discovery of "Electrolysis" or decomposition of materials to electric current



• 1824 – Sir Humphrey Davy

First developed cathodic protection in 1824 as a means of controlling corrosion on British naval ships



•1924-Ulick Richardson (U.R.) Evans

First text book on corrosion "Corrosion of Metals" (ICorr award)







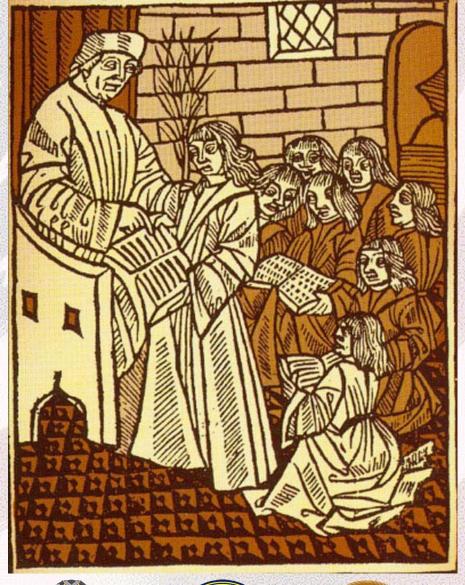








Leon Battista
Alberti Conducting
the
First Corrosion
Forum, circa 1450















Corroded Navy Pier















Army Equipment Headed for Iraq







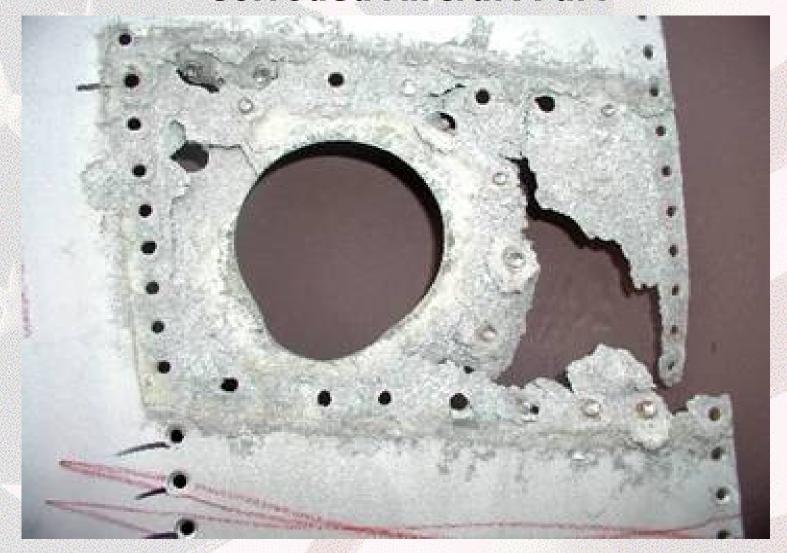








Corroded Aircraft Part







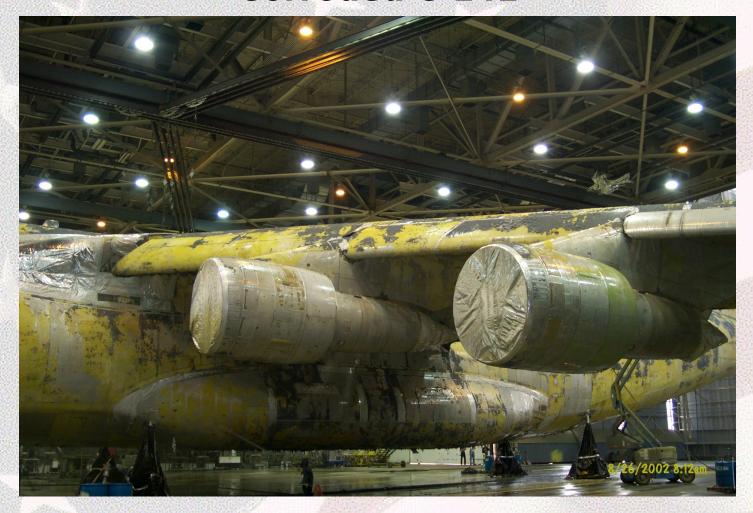








Corroded C-141















Corrosive Navy Deck Environment















Topics

- Impact of Corrosion
- Congressional Mandate
- Vision, Policy and Strategy
- Accomplishments and Expectations













Impact of Corrosion

DOD Cost of Corrosion -

\$10B to \$20B per year

- Most dollars go toward mitigation
 - Detection and assessment of corrosion
 - Treatment to prevent or retard added effects
 - Repair damaged equipment or facilities





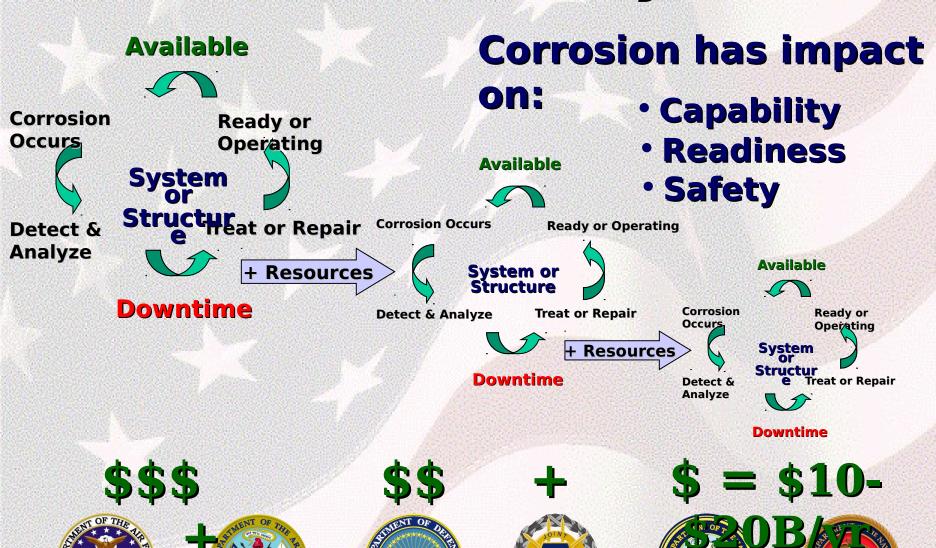








The Vicious Cycle



The Law

Public Law 107-314 Sec: 1067. Prevention and mitigation of corrosion of military equipment and infrastructure requires that:

- DoD designate a responsible official or organization
- DoD develop a long-term corrosion strategy to include
 - Expansion of emphasis on corrosion prevention & mitigation
 - Uniform application of requirements and criteria for the testing and certification of new corrosion prevention technologies within common materiel, infrastructure, or operational groupings
 - Implementation of programs to collect and share information on corrosion within the DoD
 - Establishment of a coordinated R&D program with transition plans

Strategy to include policy guidance & assessment of funding and personnel resources required













Office of the Secretary of Defense REPORT TO CONGRESS to Reduce Corrosion and the Effects of Corrosion and the Reduce Corrosion and the Reduce Corrosion and the Reduce William Equipment and Infrastructure Reduce Corrosion and the Effects of Corrosion

Reduce Nuitary Equipment and Infrastructure

Department of Defense

On the Military Department of Defense

Pal Deputy inder Secretary of Defence

Download from www.dodcorrosionexchange.













Vision

- New culture addresses long-term effects of corrosion and creates new paradigms for characterizing, preventing and treating corrosion
- Cooperative efforts between government, industry and academia to
 - accelerate modernization and close unneeded facilities
 - improve corrosion resistance products, systems and facilities
 - predict corrosion potential and effects
 - implement affordable detection and mitigation methods
- Standard procedures for specs and standards and for qualification, validation and verification
- Rapid, reliable, web-based exchange of information
- Safe, affordable equipment and facilities that
 - perform at required quality level
 - are available to perform when needed
 - can be acquired, operated and maintained at a reasonable cost













Policies

- Revitalize approach by implementing best practices and best value decisions
- Objectively evaluate methods to prevent or mitigate corrosion through objective trade-offs
- Evaluate response to corrosion control requirements – <u>early in review process</u> <u>by decision authorities at every level</u>
- Include planning guidance in guidebooks and other appropriate documents













Strategies

- Rapidly replace aging assets and close marginal facilities
- Web-based communication and sharing of best practices
- Corrosion control planning part of performance-base acquisition and logistics
- Streamline specifications, standards and qualification processes
- Formal acquisition review structure up through DAB
 - Form Corrosion Prevention and Control Teams
 - Include Integrating and Overarching IPTs in structure
- Review and update acquisition-related directives to reflect corrosion policies and requirements













Organization

- Corrosion Official: PDUSD(AT&L), Hon. Michael W. Wynne
- Director, Corrosion Poli Dunmire

The Three Rustcateers















IPT Structure

- Corrosion Prevention and Control IPT (CPCIPT)
 - Provide strategic review and advice
 - Develop and recommend policy guidance
- Working IPTs (WIPTs)
 - Policy and requirements
 - Impact, metrics and sustainment
 - Science and Technology
 - Communication and outreach
 - Training and Doctrine
 - Facilities
 - Specifications and standards













Accomplishments

- Identified "Quick Hits"
- DOD Strategic Plan for Corrosion Prevention and Mitigation
- Six Year Program Budget Defined
- Corrosion Policy in
 - DODD 5000.1
 - Guidebook for Designing and Assessing Supportability in DOD Weapon Systems
 - CPC Requirements included in ICD/CDD
 - DFAR
 - DODI 5000.2
- CPC part of Performance Based Acquisition and Logistics
- CPC Planning Guidebook published













CPC Planning Guidebook



Issued by: PDUSD (AT&L)

Issued by: PDUSD (AT&L)

Director, Corrosion Policy and Oversight

(Spiral No. 1 - DECEMBER 2003)

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Accomplishments

- Identified "Quick Hits"
- DOD Strategic Plan for Corrosion Prevention and Mitigation
- Six Year Program Budget Defined
- Corrosion Policy
- J4 Will Include CPC Requirements in ICD/CDD
- CPC part of Performance Based Acquisition and Logistics
- CPC Planning Guidebook published
- Communication and Outreach Efforts
 - Corrosion Website
 - Special Interest Groups SIGs
 - AMPTIAC Quarterly Issue
 - AT&L Magazine
- Training
 - CPC Training Plan and Curriculum
 - Defense Acquisition University courses and video
 - NACE involvement
 - Mr. Wynne Training Video













What We Expect Getting Involved

- Develop better materials & designs
- Select corrosion resistant materials & processes
- Reduce effects of corrosion & reduce resource consumption
- Exchange ideas and successes













What We Expect Planning

- Develop Corrosion Prevention and Control (CPC) Plans
- Use CPC Planning Guidebook
 - Management planning
 - Design requirements
 - Procurement specifications
- Justify investment in corrosion prevention
 - Return on Investment (ROI) analysis
 - Track and validate ROI













What We Expect Specifications and Standards

- Determine what specs and standards are needed
- Use available databases
 - ASSIST at DLA
 - DOD Corrosion Exchange Web Site
 - NACE Web Site
- Use DOD Specs and Standards Matrix
 - Currently under development
 - Will provide current applicable specs by service, system, etc.













What We Expect Other Actions

- Users articulate needs and constraints
- R&D community advertise technologies and capabilities
- Facilities and equipment groups coordinate and cooperate
- Everyone identify training needs and get people trained
- Identify near-term high-leverage programs
- Advertise successes
- Share technologies and experiences













Summary

- We are succeeding!
- We have excellent inter-service, inter-agency and military-civilian cooperation!
- We are getting wide-spread support for our WAR ON CORROSION











